

# Gender development and reassignment

Richard Green

## Abstract

Gender dysphoria is discomfort living as a male or as a female. When sufficiently distressing it leads to the request for 'sex change'. The age range of patients is adolescence to mid-life, and three-quarters are born male. Clinical practice should proceed from reversible steps to the more irreversible. Clothing change and name change precede hormone administration, which may precede surgery. The safest clinical process is the 'Real Life Experience'. This is the trial period, of at least 1 year, of full cross-gender living prior to eligibility for surgical interventions. During this time some patients may revert to the original gender role. For those who complete the sex reassignment process, the reported quality of life is generally superior to that experienced in the pre-transition life period.

**Keywords** gender identity disorder; sex change; sexual orientation; transsexual

Gender identity development as male or female, a fundamental feature of personhood, remains enigmatic. More puzzling is when it contradicts the person's birth sex as male or female. Attempts to understand that discrepancy, exemplified by transsexualism, harness knowledge from research on prenatal sex hormones, genetics, brain function and influences of socialization.

## Influences on gender identity

### Biological

**Hormonal influences:** clinical and research interest has targeted inborn factors in the establishment of gender identity as male or female and gender-typed behaviours as masculine and feminine. Prenatal sex steroid levels, notably androgens, are linked to gender behaviour and perhaps gender identity.

A well-studied population is 46XX females with congenital virilizing adrenal hyperplasia with excessive androgen production prenatally. These girls are 'tomboyish' in play; as adults, they have somewhat higher rates of same-sex sexual attraction and a few have a male identity and request sex reassignment.

**Richard Green MD FRCPsych** is Professor of Psychiatry, Emeritus, at the University of California, USA, and Professor of Psychological Medicine at Imperial College Faculty of Medicine, London, UK. His medical degree is from Johns Hopkins University, USA, and his law degree is from Yale University, USA. He has been publishing papers on gender identity since 1960. Conflicts of interest: none declared.

## What's new?

- For adolescents, increasing clinical experience confirms the use of puberty-blocking medications and earlier intervention with cross-sex hormones
- For some adult males whose facial bone structure is very masculine, privately funded facial recontouring surgery may effect a marked change in appearance
- Legal recognition and protection has increased: sex-reassigned persons can change their birth certificate to their new sex in the UK; they can also marry a person of the same birth sex

By contrast, the absence of androgen influence is found in the complete androgen insensitivity syndrome, in which the tissues of 46XY males are unable to utilize androgen. As infants they appear to be normal girls. They develop a female identity and later sexual attractions are to males.<sup>1</sup>

An indirect look at brain function in adults with gender identity disorder (transsexualism) reveals differences, possibly sex-steroid influenced. Hand-use preference begins in the first trimester of pregnancy and may be influenced by prenatal sex hormone levels. Both males and females with gender identity disorder are more often non-right-handed compared with non-transsexuals.<sup>2</sup> Fingerprint patterns also begin in the first trimester of pregnancy and appear to be influenced then by sex steroids. Males with gender identity disorder sexually attracted to male partners differ in these patterns from transsexual males attracted to females and from non-transsexuals.<sup>3</sup>

**Genetic influences:** an increased rate of family co-occurrence of cross-sex gender identity may be found in twins and non-twin siblings or in both parent and child.<sup>4</sup> However, the great majority of adults with gender identity disorder are unaware of having gender atypical relatives. A family-tree study shows a dearth of uncles on the mother's side with male transsexuals; this is also reported in families with male homosexuals. This can be explained with genomic imprinting, whereby a genetic factor passed from the maternal grandmother to her daughter can be lethal to one generation of males and result in atypical psychosexual development in the next.<sup>5</sup>

**Brain anatomy:** the most dramatic suggestion of a biological contribution to gender identity is that reported from seven brains studied post mortem. A central subdivision of the bed nucleus of the stria terminalis typically shows a male-female size difference: it was female-sized in six brains from male-to-female transsexuals, and male-sized in one female-to-male transsexual.<sup>6</sup> However, the size difference does not manifest until adulthood, years after the emergence of cross-sex identity for many transsexuals.

**Socialization:** during their early years children are encouraged to adopt conventional boy or girl interests in clothing, toy and

game preferences. This influence appears to be stricter with boys. To date, no consistent pattern of socialization has been found in association with gender identity disorder in children. Relative father absence has been found in some research and some clinicians describe mother-son psychological symbiosis. Parental encouragement of boyhood femininity is also sometimes described.<sup>7</sup>

### **Early evidence of gender identity disorder**

Gender identity and gender behaviour emerge early and by the end of the third year are usually in accord with that expected from birth sex. As extensive sex-typed behaviours of male and female children evolve in most children, a small minority manifest extensive cross-gender behaviours. A 5-year-old boy may like to dress up whenever he can in his sister's or mother's clothing; a Barbie doll may be his favourite toy; he may draw pictures with female characters only; he may role-play as mummy in mummy-daddy games and imitate female characters from the media; he may associate primarily or exclusively with girls; he will avoid activities conventional for boys; he may say that he wishes to be a girl. Girls too, in numbers smaller than with boys, may consistently show behaviours typical of boys, show a strong aversion to girl-type activities and state that they are boys or will become men.

These are extreme deviations from conventional sex-typed behaviours and do not represent androgynous children or children who merely do not conform to sex-role stereotypes. The diagnosis of gender identity disorder requires that children be unhappy being the sex to which they were born. They typically experience social stigma as a consequence of their behaviour.<sup>7</sup>

Surprisingly, although the behaviours of these children are similar to those recalled by adults who want to change sex, most children with gender identity disorder do not mature into adults with gender identity disorder (transsexualism). In the author's 15-year prospective study of dozens of these boys,<sup>8</sup> three-quarters matured into bisexual or gay men. Only one reported gender dysphoria as a young adult. Reasons for this outcome remain speculative. Perhaps because there are many more people who are homosexual than transsexual, with a relatively small sample the probability of the far rarer behavioural outcome is low. Perhaps the identification of the cross-gender behaviours by parents early on and attempts to modify them facilitated living as adults in the sex expected at birth. Intervention with children is usually focused on enabling them to feel more comfortable being a child of the sex to which they were born. It attempts to invoke greater understanding that they can have androgynous behaviours or avoid stereotypical behaviours they find aversive and still live in their birth sex role. Interventions are not designed, nor could they be expected to be designed, to focus on later sexual orientation. Follow-up studies of cross-gendered girls also reveal a higher than typical rate of same-sex attraction as well as transsexualism.<sup>9</sup>

### **Gender identity disorder in adolescents**

The clinical significance of gender identity disorder in adolescents differs from that in childhood and is more closely related to that in adulthood. These adolescents are unhappy with the

pubertal body changes expected by nature of their birth sex. They want medical treatment to halt those changes and treatment to have their body develop as a person of the other sex. They may request sex reassignment surgery by late adolescence.

Social distress experienced by adolescent transsexuals can be profound, resulting in school avoidance and peer group isolation. Treatment in adolescence is controversial. One approach is halting and then perhaps reversing sex-typed adolescent body changes. This is significant for the person born male convinced that he should be a girl and then a woman. Male puberty renders social passing later in life as a women problematic. Consequently, some clinicians are putting puberty on hold for 1 year or 18 months with a gonadotrophin-releasing hormone (GnRH) agonist. This delays the unwanted insignia of sexual development and gives additional time in which to explore issues of gender identity and a future course. For adolescents who continue with gender identity disorder beyond this 'holding pattern', cross-sex hormone administration can be considered in a manner similar to that for adult patients. However, not all early adolescents with gender identity disorder will persist with this through the teenage years. Thus it can be a difficult clinical decision regarding endocrine interventions.<sup>10</sup>

### **Adult gender identity disorder**

#### **Psychotherapy**

Although adult patients with gender identity disorder would prefer not to have this disorder, they are typically not receptive to psychotherapy directed at reversing their gender identity. However, patients requesting sex reassignment can be helped with psychotherapy, although not experiencing major change in gender identity. Some patients may have unrealistic expectations of the benefits of 'sex change'. Although remaining to some degree gender dysphoric, they may effect strategies for living in their birth sex and accommodating to their gender dysphoria.

#### **Persons born male**

Typically, 4 out of 5 patients presenting with adult gender identity disorder are born male. Clinical evidence suggests that they separate into two major groups.

- One group were very feminine as boys, remained feminine in adolescence, are sexually attracted to male partners and pursue sex reassignment in the late teens or 20s.
- A second group were less feminine as boys, experienced sexual arousal accompanying cross-dressing during adolescence and young adulthood and may be sexually attracted to female partners. Often they have married and fathered children. They present to medicine requesting sex reassignment later in life.

Earlier in the evolution of treatment approaches to transsexuals, more weight was given to the developmental histories provided by patients. There was reluctance to initiate endocrine and surgical treatment for those with a fetishistic cross-dressing and heterosexual background. However, as it became known in the gender dysphoric community what history one should provide to move forward with sex reassignment, histories became increasingly uniform and questionably valid. Thus the emphasis shifted from the past to the future adaptation of the patient. The 'Real Life Experience' became the rite of passage for adults of both sexes requesting sex reassignment. This requires that the

individual spend a minimum of 1 year, preferably 2, living full-time in the aspired-for gender role. This includes at least 1 year on high doses of cross-sex hormones and the equivalent of 1 year's employment or student status in the new role. Treatment proceeds from the more reversible to the less reversible interventions. Thus, clothing change and name change precede endocrine intervention, which precedes, in some cases, surgical intervention.

Male patients are provided with oestrogens, perhaps with a progesterone and perhaps also with an anti-androgen. This will promote breast development, change hip contour and result in loss of body hair. It will also reduce or eliminate sex drive and erectile capacity. Facial hair needs to be removed with electrolysis or laser. Vocal retraining may promote a more feminine-sounding voice and if this fails surgery to alter vocal pitch may be helpful. Some patients are paying privately for facial recontouring to effect a more feminine appearance. The patient should be monitored regularly, with feedback obtained from the patient of the extent to which living in the aspired-for gender role is successful. Some will find the Real Life Experience disappointing and will revert to their birth sex role. Gender dysphoria may remain in these cases, but the individual becomes convinced that sex reassignment will not be successful.<sup>11</sup>

Surgical intervention to create a neovagina is effective cosmetically. However, the extent to which there is erotic feeling in the constructed genitalia is variable. By description, some patients report orgasm, although no physiological study has so demonstrated.

With respect to sexual orientation post-sex reassignment surgery, the majority of men becoming women want partnerships with males. However, a substantial minority are interested in sexual partners who are female or in both females and males. It is of clinical and research interest that there is dissociation between gender identity and sexual orientation.

How well do they do after sex reassignment? A follow-up of the English-language literature over a 10-year period indicated that over 85% of males who had gone through a sex reassignment programme at major medical centres reported that the surgery had been helpful. It was not regretted and they appeared to be living more successful lives (see Figure 1).<sup>12</sup>

### Persons born female

Gender identity disorder patients born female can make a very effective transition to appear as men. Administration of androgen can have a dramatically virilizing effect: the voice deepens, facial and body hair grow and there may be more muscular development. For those who are fortunate to be above average in height, the appearance is, clothed, as a conventional man. During the Real Life Experience, some transsexuals with large breasts find it difficult to conceal them as they pursue employment or student status as a man. This has led to some centres endorsing bilateral mastectomy early on in the Real Life Experience, while other centres require a minimum period of 1 year as this is an irreversible intervention. Androgen injections will stop menstruation, result in clitoral hypertrophy and increase sex drive.

Surgical interventions include bilateral mastectomy and perhaps hysterectomy/ovariectomy and phalloplasty. During recent years phalloplasty has improved considerably with respect to cosmetic appearance and function. While not indistinguishable from

### Case study 1

Christine Burns MBE is a leading transsexual community activist in the UK. She is a member of the Parliamentary Forum on Transsexualism, chairs the transgender workstream in the Department of Health's Sexual Orientation and Gender Identity Advisory Group, and writes extensively for the campaign group Press for Change on transsexual people's health needs and social inclusion issues. She had a leading role in the introduction of employment protection legislation for transsexual people in 1999 and liaised closely with ministers and government officials throughout the process leading to the Gender Recognition Act in 2004. She is also directly responsible for significant changes in the way that the UK media now presents transsexual people. Christine has worked as Lay Chair dealing with NHS complaints and was a Council member of the human rights group Liberty for six years. She was awarded an MBE in 2005 for services to gender issues.



**Figure 1**

a natural penis, it does approximate substantially more than was the case a decade ago. A fluid implant can be inserted to produce erection. A urethra can be created at least for a substantial portion of the length of the phallus to enable urination while standing. Ultimately, tissue engineering to construct a phallus may supersede current procedures.

The overwhelming majority of female-to-male transsexuals are interested in female partners. However, there are others, perhaps 1 in 10, whose sexual preference is for a male partner. Analogously to their counterpart transgendered persons born male who become lesbians, they become gay men.

Follow-up from the same 10-year period reported above indicates that over 95% of persons born female who had been treated at major medical centres were satisfied with the sex reassignment (see Figure 2).<sup>12</sup>

### Legal and social implications

Substantial protections have been provided by several countries through court decisions or by statute to help the transgendered. Most US states will provide birth certificate change or modification

## Case study 2

Stephen Whittle PhD MA LLB BA is Professor in Law at Manchester Metropolitan University and Vice-president of Press for Change, the UK's transgender lobby group. Stephen transitioned from female to male in 1975 and has lived with his partner Sarah for over 25 years. They are now married and have four children by donor insemination. In 2002, Stephen received the Liberty/Justice Human Rights Award for 30 years of legal and campaigning work for transgender rights. His publications include *Respect for equals: transsexual and transgender rights* (Cavendish Publishing, 2002) and *A transgender studies reader* (Taylor & Francis, 2004). He was awarded an MBE in 2005 for services to gender issues.



**Figure 2**

so the person has full legal status in the new gender. This will permit marriage in 49 of 50 states that do not permit same-sex marriage should the post-operative transsexual wish to marry someone of the same birth sex. In Europe until recently, the UK, along with Albania, Andorra and Ireland, was still denying birth certificate change. However, a European Court directive required that the UK permit birth certificate change, and a new statute has so allowed, after the person has lived for 2 years in the opposite sex role. This will allow marriage to a person of the same birth sex.

In the UK, transsexuals are protected in the workplace under sex discrimination statutes that have been in place for a decade. This is important, as part of the Real Life Experience is a year's employment in the desired gender role. In the USA, many states and the federal government have recently provided some employment protection for the transgendered.

Occasionally transgendered persons are victims of hate crime. There are efforts in the USA and UK to include transgender

assault in current hate-crime legislation, under which jurisdictions have provided enhanced punishment for crimes based on a victim's race or religion.

## Conclusion

Transsexualism has become widely acknowledged by the general public during the past two decades. Gradually, treatment has become accepted into mainstream medicine. Recently, legal protections have been provided to enable transsexuals to live their lives without civil stigma. Physicians require knowledge and understanding of this relatively rare clinical condition. General practitioners typically are the first professionals consulted; specialist referrals to psychiatrists usually follow. Transsexuals demand and deserve up-to-date, compassionate treatments. No longer are they medical orphans. ♦

## REFERENCES

- 1 Green R. Sexual identity and sexual orientation. In: Pfaff D, Arnold A, Etgen A, Fahrbach S, Rubin R, eds. *Hormones, brain and behavior*. San Diego, CA: Academic Press, 2002.
- 2 Green R, Young R. Hand preference, sexual preference, and transsexualism. *Arch Sex Behav* 2001; **30**: 565–74.
- 3 Green R, Young R. Fingerprint asymmetry in male and female transsexuals. *Pers Individ Dif* 2000; **29**: 933–42.
- 4 Green R, Keverne EB. The disparate maternal aunt-uncle ratio in male transsexuals: an explanation invoking genomic imprinting. *J Theor Biol* 2000; **202**: 55–63.
- 5 Green R. Family co-occurrence of 'gender dysphoria': ten sibling or parent-child pairs. *Arch Sex Behav* 2000; **29**: 499–507.
- 6 Zhou JN, Hofman MA, Gooren LJ, Swaab DF. A sex difference in the human brain and its relation to transsexuality. *Nature* 1995; **378**: 68–70.
- 7 Green R. Sexual identity conflict in children and adults. New York: Basic Books, 1974.
- 8 Green R. The 'sissy boy syndrome' and the development of homosexuality. New Haven, CT: Yale University Press, 1987.
- 9 Zucker R. Gender identity disorder in children and adolescents. *Ann Rev Clin Psychol* 2004; **1**: 467–92.
- 10 Smith Y, van Goozen SH, Cohen-Kettenis PT. Adolescents with gender identity disorder who were accepted or rejected for sex reassignment surgery: a prospective follow-up study. *J Am Acad Child Adolesc Psychiatry* 2001; **40**: 472–81.
- 11 Green R. Gender identity disorders. In: Kaplan H, Sadlock B, eds. *Comprehensive textbook of psychiatry VIII*. Baltimore, MD: Lippincott, Williams and Wilkins, 2005.
- 12 Green R, Fleming D. Transsexual surgery follow-up: status in the 1990s. In: Bancroft J, Davis C, Weinstein D, eds. *Annual review of sex research*. Mt Vernon, IA: Society for the Scientific Study of Sexuality, 1991.